REMARKS

Currently pending claims 1-10 and 12-36 are for consideration by the Examiner.

The Examiner rejected claims 1-3, 6, 20, 21, 23, 31, 33, 35, and 36 under 35 U.S.C. §103(a) as allegedly being unpatentable over Yamamoto et al. (EP 0544915 A1, hereinafter "Yamamoto").

The Examiner rejected claim 4 under 35 U.S.C. §103(a) as allegedly being unpatentable over Yamamoto in view of Gundotra et al. (US Patent 5369880, hereinafter "Gundotra").

The Examiner rejected claims 7-10, 12-19, 24-28, 30, 32, and 34 under 35 U.S.C. §103(a) as allegedly being unpatentable over Yamamoto, in view of Yamashita et al. (US Patent 6179935, hereinafter "Yamashita").

The Examiner rejected claims 5, 18, 22, and 29 under 35 U.S.C. §103(a) as allegedly being unpatentable over Yamamoto or Yamamoto and Yamashita, in view of Behlen et al. (US Patent 5598033, hereinafter "Behlen").

Applicants respectfully traverse the final office action and the §103 rejections with the following arguments.

Final Office Action

Since the Examiner's rejection of claims 31 and 33 is based on a new ground of rejection, and since Applicants did not amend the claims in the prior office action response filed June 6, 2003, Applicants respectfully contend that the final office action is improper. Accordingly, Applicants respectfully request that the finality of the present office action be withdrawn and that the present final office action be converted to a non-final office action.

35 U.S.C. §103: Yamamoto

The Examiner rejected claims 1-3, 6, 20, 21, 23, 31, 33, 35, and 36 under 35 U.S.C. §103(a) as allegedly being unpatentable over Yamamoto et al. (EP 0544915 A1, hereinafter "Yamamoto").

Applicants respectfully contend that claims 1 and 20 are not unpatentable under 35 U.S.C. §103(a) over Yamamoto, because Yamamoto does not teach or suggest each and every feature of claims 1 and 20.

As a first example of why Yamamoto does not teach or suggest each and every feature of claims 1 and 20, Yamamoto does not teach: "soldering a lead-free solder member to the substrate **without using a joining solder** to effectuate the soldering" (claim 1) and "a lead-free solder member soldered to the substrate **with no joining solder** between the solder member and the substrate" (claim 20), (emphasis added).

The Examiner argues: "Referring to Figs. 4A-8 and related text, discloses Yamamoto discloses a method for forming an electronic structure and inherently the structure formed by the method, the method comprising the steps of providing a substrate 50; and soldering a lead-fee solder member to the substrate without using a joining solder to effectuate the soldering (see page 5, lines 5-14)".

In response to the preceding argument by the Examiner, Applicants respectfully contend that page 5, lines 5-14 of Yamamoto does not teach or suggest that the solder member 56 is joined to the substrate 50 without using a joining compound to effectuate the soldering. All that page 5, lines 5-14 of Yamamoto discloses is: "projections which consist of high-temperature

solder being formed at once on the conductive patterns by a reflow method or a flow method. ." Applicant contend, however, that a reflow method or flow method is known to be utilized when a joining solder is used to effectuate the soldering. Therefore, page 5, lines 5-14 of Yamamoto does not teach or suggest that the solder member 56 is joined to the substrate 50 without using a joining compound to effectuate the soldering, as alleged by the Examiner. Applicants contend that Yamamoto is totally silent as to whether a joining compound is used.

As a second example of why Yamamoto does not teach or suggest each and every feature of claims 1 and 20, Yamamoto does not teach or suggest "wherein the solder member **consists essentially of** a tin-antimony alloy, and wherein the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder consisting essentially of tin by weight" (emphasis added).

The Examiner argues: "Referring to Figs. 4A-8 and related text, ... the solder member consists essentially a tin-antimony alloy, and wherein the tin-antimony alloy consists of about 15% antimony by weight or less and a remainder consisting essentially of tin by weight (See page 7, lines 24-28)."

In response to the preceding argument by the Examiner, Applicants respectfully contend that the exact language in page 7, lines 24-28 of Yamamoto is: "The high-temperature solder used in the present invention **includes** ... Sn-Sb solder **containing** 15% by weight of Sb (antimony) or less" (emphasis added). Applicants contend that Yamamoto uses the open-ended word "includes" which does not satisfy the more limiting language of "consists essentially of" in the feature "wherein the solder member consists essentially of a tin-antimony alloy" in claims 1

and 20. Applicants further contend that Yamamoto uses the open-ended word " containing" which does not satisfy the more limiting language of "consisting essentially of" in the feature "wherein the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder consisting essentially of tin by weight" in claims 1 and 20. See MPEP 2111.03, which states:

> "The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997) ("Comprising" is a term of art used in claim language which means that the named elements are essential, but other elements may be added and still form a construct within the scope of the claim.); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948) ("comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts")."

The meaning of "consisting essentially of" is defined in MPEP 2111.03 which states: "The transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention (citing *In re Her*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976)).

In "Response to Amendment", the Examiner argues: "the use of "consists essentially" allows for the inclusion of additional materials that do not materially affect the basic and novel characteristics. In Yamamoto the solder is Sn-Sb, this implies that any additional material included in the Sn-Sb solder would not materially affect the solder member **consists essentially** of a tin-antimony alloy of the Sn-Sb."

In response to the preceding argument by the Examiner, Applicants respectfully contend that it is impossible to deduce that "any added material" would not change the basic and novel characteristics of a solder member consisting essentially of a tin-antimony alloy. Whether an added material would materially affect said basic and and novel characteristics depends on what specific material is added and the amount of the specific material that is added. Since Yamamoto evidences an intent not to limit the high-temperature solder to Sn-Sb (through use of the non-limiting language "includes" and "containing"), and since Yamamoto does not disclose specific material and their amounts that could be added, Applicants respectfully contend that Yamamoto does not teach or suggest a lead-free solder member having a composition that satisfies the "consisting essentially of " language in claims 1 and 20.

In addition, Applicants respectfully contend that the Examiner has disregarded the fact that the terms "consisting essentially of" and "including" / "containing" have substantially different legal interpretations in patent law. . Applicants respectfully contend that the legal difference between "consisting essentially of" and "including" / "containing" is firmly established in case law (which is reflected in MPEP 2111.03, quoted *supra*) and the Examiner has a heavy burden of proof to support the Examiner's contention that the phrases "including" and "containing" in Yamamoto have the same meaning in as "consisting essentially of"in claims

1 and 20. Applicants further contend that the Examiner has not presented a persuasive legal analysis establishing that the phrases "including" and "containing" in Yamamoto have the same meaning in as "consisting essentially of"in claims 1 and 20. Accordingly, Applicants contend that the Examiner has not established a *prima facie* case of obviousness in relation to claims 1 and 20.

Based on the preceding arguments, Applicants respectfully maintain that claims 1 and 20 are not unpatentable over Yamamoto, and that claims 1 and 20 are in condition for allowance. Since claims 2-6, 31, and 35 depend from claim 1, Applicants contend that claims 2-6, 31, and 35 are likewise in condition for allowance. Since claims 21-23, 33 and 36 depend from claim 20, Applicants contend that claims 21-23, 33 and 36 are likewise in condition for allowance.

35 U.S.C. §103: Yamamoto In View Of Yamashita

The Examiner rejected claims 7-10, 12-19, 24-28, 30, 32, and 34 under 35 U.S.C. §103(a) as being unpatentable over Yamamoto, in view of Yamashita et al. (US Patent 6179935, hereinafter "Yamashita").

Applicants respectfully contend that claims 7 and 24 are not unpatentable over Yamamoto in view of Yamashita, because Yamamoto in view of Yamashita does not teach or suggest each and every feature of claims 7 and 24.

As a first example of why Yamamoto does not teach or suggest each and every feature of claims 1 and 20, Yamamoto does not teach: "soldering a lead-free solder member to the substrate **without using a joining solder** to effectuate the soldering" (claim 7) and "a lead-free solder member soldered to the first substrate **with no joining solder** between the solder member and the first substrate" (claim 24), (emphasis added). With respect to said first example, Applicants' contention that claims 7 and 24 are not unpatentable over Yamamoto in view of Yamashita are based on the same arguments presented *supra* for Applicants' contention that claims 1 and 20 are not unpatentable over Yamamoto.

As a second example of why Yamamoto does not teach or suggest each and every feature of claims 7 and 24, Yamamoto in view of Yamashita et al. does not teach or suggest "wherein the solder member consists essentially of a tin-antimony alloy, and wherein the tin-antimony alloy consists of about 3% to about 15% antimony by weight and a remainder consisting essentially of tin by weight". With respect to said second example, Applicants' contention that claims 7 and 24 are not unpatentable over Yamamoto in view of Yamashita are based on the same arguments presented *supra* for Applicants' contention that claims 1 and 20 are not unpatentable over

Yamamoto.

Based on the preceding arguments, Applicants respectfully maintain that claims 7 and 24 are not unpatentable over Yamamoto in view of Yamashita, and that claims 7 and 24 are in condition for allowance. Since claims 8-19 and 32 depend from claim 7, Applicants contend that claims 8-19 and 32 are likewise in condition for allowance. Since claims 25-30 and 34 depend from claim 24, Applicants contend that claims 25-30 and 34 are likewise in condition for allowance.

35 U.S.C. §103: Yamamoto In View Of Gundotra

The Examiner rejected claim 4 under 35 U.S.C. §103(a) as allegedly being unpatentable over Yamamoto in view of Gundotra et al. (US Patent 5369880).

Since claim 4 depend from claim 1, which Applicants have argued *supra* to be patentable under 35 U.S.C. §103(a), Applicants maintain that claim 4 is not unpatentable under 35 U.S.C. §103(a).

35 U.S.C. §103: Yamamoto or Yamamoto and Yamashita In View Of Behlen

The Examiner rejected claims 5, 18, 22, and 29 under 35 U.S.C. §103(a) as allegedly being unpatentable over Yamamoto or Yamamoto and Yamashita, in view of Behlen et al. (US Patent 5598033).

Since claim 5 depend from claim 1, which Applicants have argued *supra* to be patentable under 35 U.S.C. §103(a), Applicants maintain that claim 5 is not unpatentable under 35 U.S.C. §103(a).

Since claim 18 depend from claim 7, which Applicants have argued *supra* to be patentable under 35 U.S.C. §103(a), Applicants maintain that claim 18 is not unpatentable under 35 U.S.C. §103(a).

Since claim 22 depend from claim 20, which Applicants have argued *supra* to be patentable under 35 U.S.C. §103(a), Applicants maintain that claim 20 is not unpatentable under 35 U.S.C. §103(a).

Since claim 29 depend from claim 24, which Applicants have argued *supra* to be patentable under 35 U.S.C. §103(a), Applicants maintain that claim 29 is not unpatentable under 35 U.S.C. §103(a).

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below.

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